EUROPEANA INNOVATION AGENDA

Research and innovation priorities for the European cultural heritage sector

Acknowledgements

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Executive summary

The Europeana Innovation Agenda highlights research and innovation priorities in the cultural heritage domain and advocates for their implementation across Europe. Working in consultation with the Europeana Network Association, a dedicated task force identified areas where innovation and research actions are most needed. The Agenda proposes thirteen topics that showcase the opportunities for transformation in four overarching categories: institutional strategy and impact, technological innovation, social change, and economic innovation.

Building on the Europeana Impact Assessment Framework, the Agenda positions cultural heritage as an invaluable resource for the European society. It highlights the transformative potential of an innovative cultural heritage and aims to prioritise its research and innovation needs in Europe's cultural policies and research and innovation programmes.

Introduction

Digital transformation is everywhere around us. For ten years now, Europeana has played an important role in supporting memory institutions to reap the benefits of the digital transformation, and at the same guarding the heritage sector against undesired consequences. Over the years, the Europeana Network Association has grown to be a thought leader and change agent on a number of fundamental issues. Notably, in the development of standards to make heritage objects uniformly interoperable, harnessing the power of participatory culture, developing a common method to measure impact, promoting open access and calling for copyright reform. With its wide-ranging expertise and an impressive outreach, the Europeana Network Association is in a great position to champion the growth of the cultural heritage sector.

In 2017, the Europeana Foundation Governing Board assigned a task force to develop an agenda and implementation plan that can position the innovation of the cultural heritage sector as a priority within European cultural policies and research and innovation programmes.

The Europeana Innovation Agenda identifies thirteen topics that constitute the most urgent challenges and opportunities across the European cultural landscape. The agenda highlights that while there is a strong feeling of urgency in the sector to keep up with the fast-paced digital transformation, innovation cannot be limited to technological demands within the cultural heritage institutions. Broader societal and economic challenges also require immediate and concerted actions.

The Europeana Innovation Agenda is the result of extensive desk research, consultations with the Europeana Network Association and its special interest communities as well as conversations within the Europeana Foundation Governing Board. The agenda advocates for the implementation of research and innovation actions that support the sustainable development of a technologically advanced, economically stable and socially conscious cultural heritage domain.

Research and innovation topics

Three-step approach
In order to determine what innovation means to the cultural heritage community and where it is needed most, the task force followed a three-step research approach.

First, they carried out an extensive literature review consulting the latest reports on innovation and research trends within the sector.[1] This served as the basis for formulating the initial topics for the agenda.

Second, these initial comments were complemented by ideas from the Europeana Network Association gathered during the EuropeanaTech conference in May 2018.[2] It became clear from the outset that the cultural heritage sector community faced a broad range of challenges, ranging from lack of support and training for heritage professionals and an inability to keep up with technological developments, to financial instability and the urgency to play a more prominent social role.

Building on this, the research and innovation topics were arranged around four overarching areas that all contribute to the transformation of the cultural heritage sector:

Institutional Strategy and Impact: strengthening the network of cultural heritage institutions and increasing their reach and impact.

Technological Innovation: ensuring long-term access to cultural assets and continuously improving digital content, tools and services offered by cultural heritage organisations.

Social Change: increasing the social impact of the cultural heritage sector and its contribution towards the well-being of European citizens.

Economic Innovation: enabling cultural heritage institutions to become more responsive to financial challenges and harnessing the economic impact of cultural heritage assets.

Areas of innovation that contribute to the transformation of the cultural heritage sector

As a third and final step, the achievability and urgency of each research and innovation topic were assessed. A survey was sent out to the Europeana Network Association in November 2018 to evaluate the topics with the Certainty-Impact matrix.[3]

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1 See the full bibliography here https://www.zotero.org/groups/2261357/europeana_innovation_task_force/items/

2 During the EuropeanaTech conference on the 15-16 May 2018 in Rotterdam, participants were asked 'What research and innovation topics should be included in the agenda for future development and growth of the digital cultural heritage sector?' 75 people contributed their ideas by filling in a postcard See https://pro.europeana.eu/post/meet-the-europeana-innovation-task-force

3 Survey results can be found in the document section on the Europeana Innovation Agenda page on Europeana Pro.
See https://pro.europeana.eu/page/europeana-innovation-agenda

The survey asked participants to prioritise the role of each topic by selecting one of the following options that correspond to the four areas of the matrix:
- Is there an urgent need to implement it and ACT on it NOW?
- Is this something that should INFORM STRATEGY and guide our decisions about the future of the heritage sector?
- Should we KEEP VIGILANT WATCH and prepare to act on it in the near future?
- Is it something that would be more achievable at a later stage and we should REVISIT it LATER?
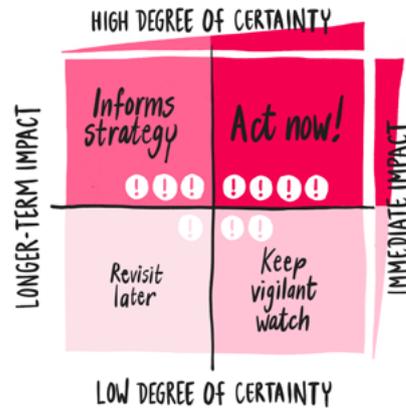
Certainty-Impact matrix

The results of this exercise provide a strong indication of where the priorities of the cultural heritage community lie and what actions should be taken to successfully stimulate and implement innovation in the domain.

The following section of the Agenda presents the outcomes of this research.

Institutional strategy and impact

The Europeana Innovation Agenda aims to strengthen the network of cultural heritage institutions and calls for actions that can increase the reach and impact of the sector.

Skills for cultural heritage professionals
Fast-paced digitisation, new technologies and changes in the socio-economic landscape constantly pose new demands on the workforce expected to implement and keep up with these developments. The lack of sufficient training and capabilities often becomes a barrier to carrying out experimental projects and competing with larger cultural organisations and the commercial sector.

The sustainable development of digital skills will be the driving force behind innovation in the heritage sector. There is a great demand for practical workshops on the use and implementation of linked open data and the development of interoperable tools and services. European policies should support continuous nurturing of talents and skills. This will enable institutions to not only keep pace
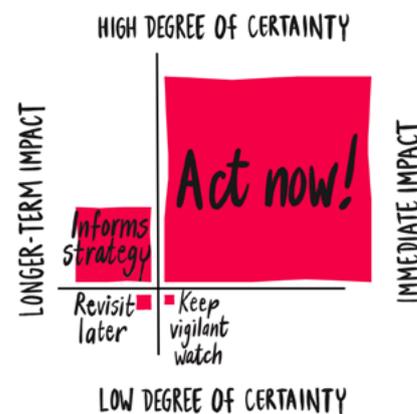
Prioritisation of skills for heritage professionals

with innovation but also cultivate the culture for experimentation that will, in return, push the innovation forward.

Opening up and reaching out

The digital turn has prompted opportunities to aggregate resources on digital platforms as well as instigated interest in cultural asset exploitation for creative and commercial industries. However, the advancement in this direction is often compromised by the lack of incentive to collaborate within and without the sector. The benefits of contributing cultural assets and expertise to collaborative projects are often outweighed by the costs and legal risks that SMEs cannot afford to incur.

Cultural policies should encourage the heritage sector to break out of institutional silos and promote the integration of efforts on European-level projects as well as the creation of partnerships with external communities and businesses. Innovation actions should be taken to foster an environment in which cultural institutions feel stimulated to open up their collections and reach out to external partners.
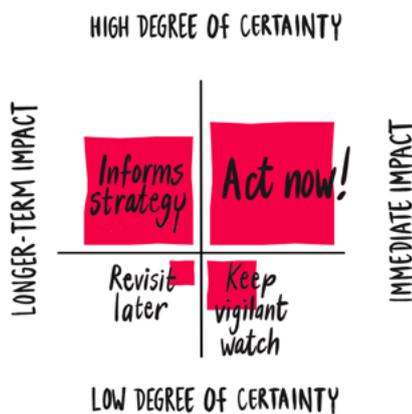

Prioritisation of opening up and reaching out

Support is needed in legal areas and the implementation of interoperable standards that will remove the barriers for participation and ease the entry into the shared European heritage landscape.

Prioritisation of frameworks and sustainable collaboration

Frameworks for sustainable collaboration

The heritage sector is increasingly taking advantage of the flow of information in the digital single market and collaborating on shared digital platforms. However, the barrier to successful partnerships is often the lack of common ground. Individual organisations hold extensive knowledge in their areas of expertise but often do not have the time and resources to share that knowledge on collaborative platforms or learn from others.

Solutions are needed to sustain long-lasting relationships between cultural heritage organisations and to drive the interest in growing shared expertise. European policies should focus on making collaborative culture attractive to individual institutions and help them benefit from participation. Organisations require infrastructures that enable them to dedicate their resources to participation in collaborative networks.

Next to the description of each topic, the survey results from the evaluation with the Impact-Certainty matrix are presented graphically. These graphs illustrate the priority of each topics as assigned by the Europeana Network Association.

Maximising audience engagement

Digital platforms have opened unprecedented possibilities for engaging with wider audiences and instantaneously delivering content to them. Yet it is not always clear whether the needs of end-users are fulfilled by the available services and tools. There is a lack of understanding of how to enable European citizens to take full advantage of cultural assets. This asks for strategies that would help institutions to deliver the right content to the right audiences.

Research actions are required to bridge this gap between cultural heritage and end-users. There is a demand for tools that can anticipate and predict user needs and analyse their use of cultural assets. It is necessary to deliver more diverse content, especially in currently underrepresented media and formats in order to reach new audiences. Institutions are keen to involve their end-users in the improvement
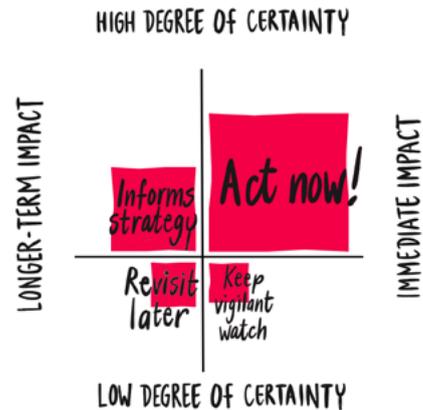
Prioritisation of maximising audience engagement

and development of tools and services to increase their impact and encourage more active cultural participation.

Technological innovation

The Europeana Innovation Agenda aims to ensure long-term access to cultural assets and calls for continuous support for the improvement of digital content, tools and services offered by cultural heritage organisations.
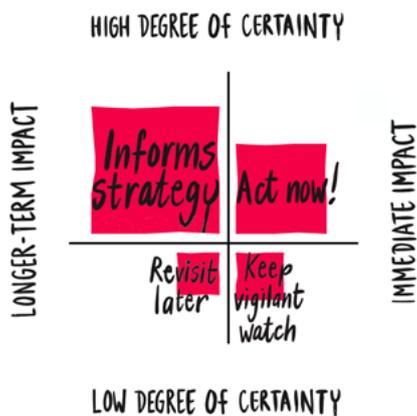
Prioritisation of digitisation and digital durability

Digitisation and digital durability

Digitisation enables cultural heritage assets to easily travel across spatial and temporal boundaries. However, the impact of digitisation in Europe is limited by the absence of technologies that can transform heterogeneous cultural artifacts into rich digital representations in a sustainable, efficient and cost-effective manner. The durability of digitised and born-digital assets is not guaranteed and is often prone to corruption.

The sector needs tools that will automate the digitisation process for massive volumes of heterogeneous artefacts and develop non-invasive technologies that offer high-quality results for multimodal assets. Concurrently,

research is required to explore innovative methods for long-term preservation of complex digital assets. Coordination actions are needed to oversee large-scale digitisation efforts across cultural institutes and support the implementation of appropriate preservation methods. This will be a crucial step towards assuring the durability of Europe's cultural legacy.
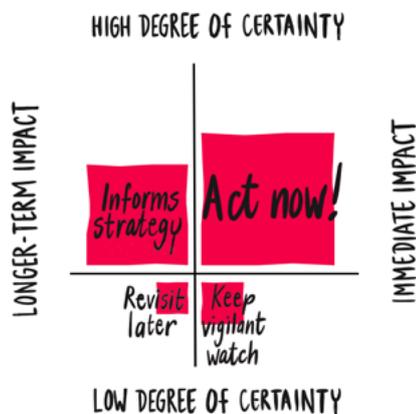
Data quality, usability and retrieval

With the availability of large volumes of complex data comes the challenge of transforming it into accessible and usable digital objects. The current workflows are not equipped to accommodate multilingual materials, 3D models and audiovisual content according to the FAIR (findable, accessible, interoperable and reusable) data principles. The absence of powerful tools for data enrichment and discovery prevents the sector from taking full advantage of the linked open data opportunities and puts barriers in front of end-users who want to engage with digital assets.

Cultural policies should stimulate research into methods that can enhance the quality, usability and retrieval of complex digital objects. Machine learning and artificial intelligence will play a crucial role here, offering innovative solutions for automatic extraction of metadata and optimisation of content searchability. The
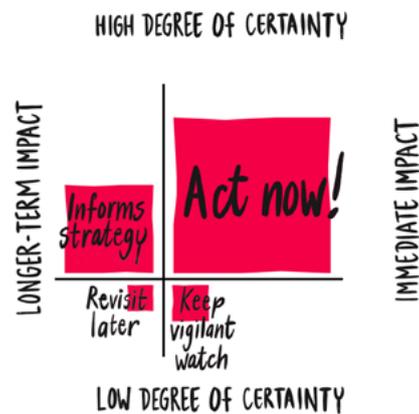
Prioritisation of data quality, usability and retrieval

sector needs to coordinate its actions and promote the interoperability of standards and tools to ensure the usability of data for diverse purposes across platforms.

Digging into data

The methods for cultural heritage curation and management are challenged by the increasing complexity of data. The sheer volume of digital objects, the diversity of metadata categories and the granular level of detail available ask for new approaches and tools that can effectively connect datasets from different contexts and extract valuable insights from them. The heritage sector needs to develop tools for the efficient management, curation and analysis of big data. More support is needed for digital humanities projects that investigate novel data mining and visualisation techniques which enable end-users to discover new perspectives from heterogeneous datasets.

Prioritisation of digging into data

Storytelling and immersive experiences

The availability of high-quality interlinked data and complex multimodal objects opens new gateways for presenting cultural heritage through narratives and engaging experiences. To take full advantage of this, the heritage sector needs to investigate how the emerging technological solutions can turn distributed digital assets into coherent stories and encourage deeper engagement with European culture.

Research actions should focus on unleashing the potential of novel technologies such as VR, AR, 360 videos and 3D modelling to offer full-body, immersive and personal encounters with cultural heritage. Institutions should experiment with these new storytelling capabilities and develop platforms and services that allow audiences to visualise the past from as yet unexplored perspectives.
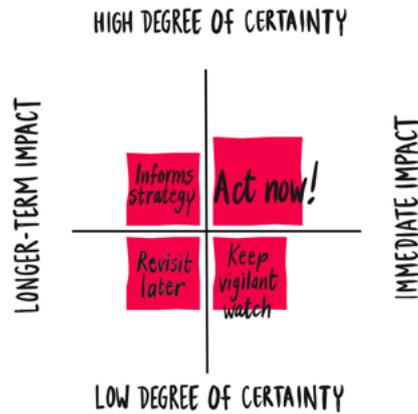
Prioritisation of storytelling and immersive experiences
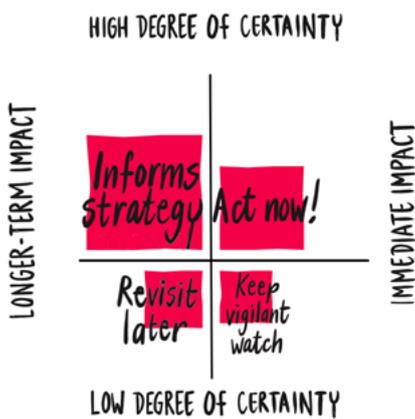
Prioritisation of infrastructures for secure, trustable and shareable content

Infrastructures for secure, trustable and shareable content

The increasingly interconnected and decentralised cultural heritage sector lacks horizontal technologies that would ensure trust and efficiency of services within the network. Distributed architectures capable of handling large volumes of data in a secure and effective way are needed to foster advancement towards a truly shared heritage across Europe.

Research actions should investigate how the heritage sector could take advantage of distributed vendor platforms such as Blockchain to guarantee the security of content and services. New methods are required to increase the efficiency and quality of sharing and improve data management workflows so that stakeholders would be incentivised to contribute.

Social change

The Europeana Innovation Agenda calls for actions to increase the social impact of the cultural heritage organisations and aims to intensify their contribution towards the well-being of European citizens.

Social impact of cultural heritage projects

Cultural heritage plays a major role in shaping inclusive societies and promoting social cohesion and integration.[4] Especially during times of political and social turmoil, cultural heritage can serve as a binding agent bringing different communities and perspectives together into a dialogue. To take full advantage of this, the heritage sector needs to take a more prominent stance in the social sphere and invest in innovative projects that reflect on the challenges that matter most to European citizens. This includes topics such as social injustice, integration of migrants and gender issues. Cultural organisations need to find ways to foster cultural diversity and engage different social groups in the construction of European identity.

Prioritisation of social impact of cultural heritage projects
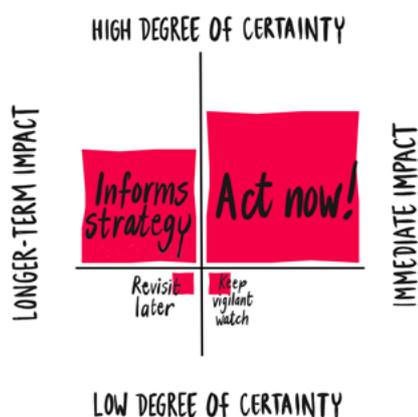
Prioritisation of cultural heritage for education

Cultural heritage for education

Cultural participation is one of the main factors that contribute towards the well-being of European citizens and their sense of belonging to society. Cultural institutions need support for the development and execution of projects and services that reach diverse age groups and create conditions for lifelong engagement with heritage. Exploiting the potential of digitisation, big data and immersive storytelling, innovative solutions are needed to embed cultural assets into education programmes and develop new digital platforms. The ease of access to diverse sources and the ability to create engaging and well-grounded narratives will foster an appreciation for cultural heritage from an early age as well as help audiences to discover and reconnect with European culture.

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4 The Eurobarometer survey conducted in 2017 indicates that European citizens value culture as the main factor contributing to the feeling of community among the EU nations. See file:///C:/Users/JSC050/Downloads/eb88_data_annex_en%20.pdf
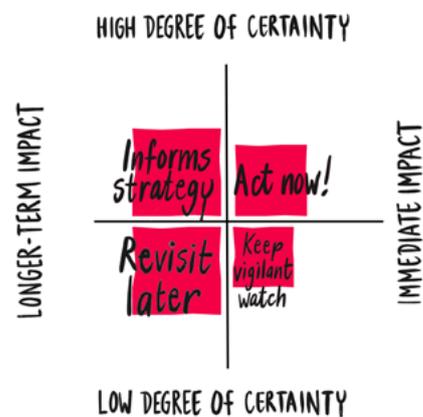
Economic innovation

The Europeana Innovation Agenda recognises the financial challenges faced across the cultural heritage sector and aims to stimulate research into more sustainable business models.

Economic potential of cultural heritage assets

Cultural heritage is an important economic driver for Europe, stimulating growth and employment across diverse industries.[5] The sector is no longer seen as a burden on the economy but rather as a financially attractive resource. However, in many cases opportunities to valorise cultural assets are missed due to the lack of experience and support in this area.

Research actions are needed to explore how to harness this economic potential of cultural heritage. European policies should promote experimentation with innovative methods that can turn cultural assets into sustainable sources of revenue. Large-scale digitisation and online platforms offer creative opportunities to exploit this potential and boost the attractiveness of the sector.

Prioritisation of economic potential of cultural heritage assets
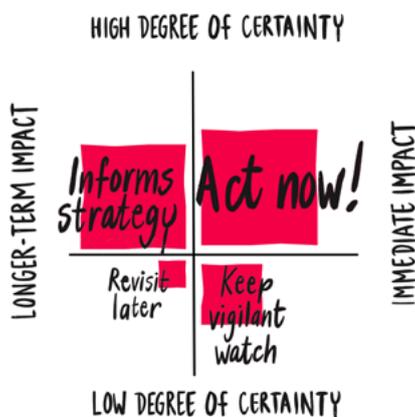
Prioritisation of new routes to funding

New routes to funding

The urgency for innovation within the sector is high, yet the lack of resources often stands in the way of its implementation. SMEs that rely primarily on public funding to realise projects for local communities are particularly susceptible to this. They need business models that would make them less vulnerable to financial pressures.

Research actions should investigate how alternative funding options such as crowdfunding, donation-based initiatives and impact investment could be implemented to make the heritage sector more responsive to economic challenges.

Membership-based business model where larger institutions collectively support SMEs who, in turn, deliver services for the whole heritage sector should be explored. Policies that promote and coordinate private sector investments for individual cultural institutions as well as large-scale

European projects are needed. Incentivising financial support from such alternative sources can play a vital role in providing sustainable support for the sector and allowing it to seize the opportunities for growth and innovation.

Impact of an innovative cultural heritage sector

The Europeana Innovation Agenda aims to presents a strong case for the inclusion of the proposed topics in the European research and innovation programmes. Aligning the research and innovation needs with Europeana's vision and creating synergies with the strategies proposed by the EU is crucial for accomplishing this.

For this reason, the Europeana Impact Assessment Framework was used as a reference point to map the potential benefits of the research and innovation actions. The framework accentuates the contribution of an innovative heritage sector towards the wellbeing of different groups - bringing socio-cultural benefits to the end-user communities, widening the opportunities for the cultural heritage network and improving the welfare of stakeholder organisations across

various industries. It accommodates societal, legal, economic and technological challenges that are presented in the Innovation Agenda. By positioning the contribution of the cultural heritage sector towards the shared goals of the European society, the agenda highlights the urgency and benefits of investing in its research and innovation needs.

The proposed research and innovation topics were aligned with the Impact Assessment Framework. The result of this is a new mapping that manifests the impact of an innovative cultural heritage sector. It demonstrates how topics that address institutional, technological, societal and economic challenges all contribute to the impact on deeper understanding, innovative and influential network and improved welfare in the European landscape.

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5 Research from 2014 shows that creative and cultural industries contribute to 4.2% of Europe's GDP.
https://www.ey.com/Publication/vwLUAssets/Measuring_cultural_and_creative_markets_in_the_EU/%24FILE/Creating-Growth.pdf
6 Europeana strategy 2015-2020, Impact. See https://pro.europeana.eu/post/europeana-strategy-2015-2020-impact
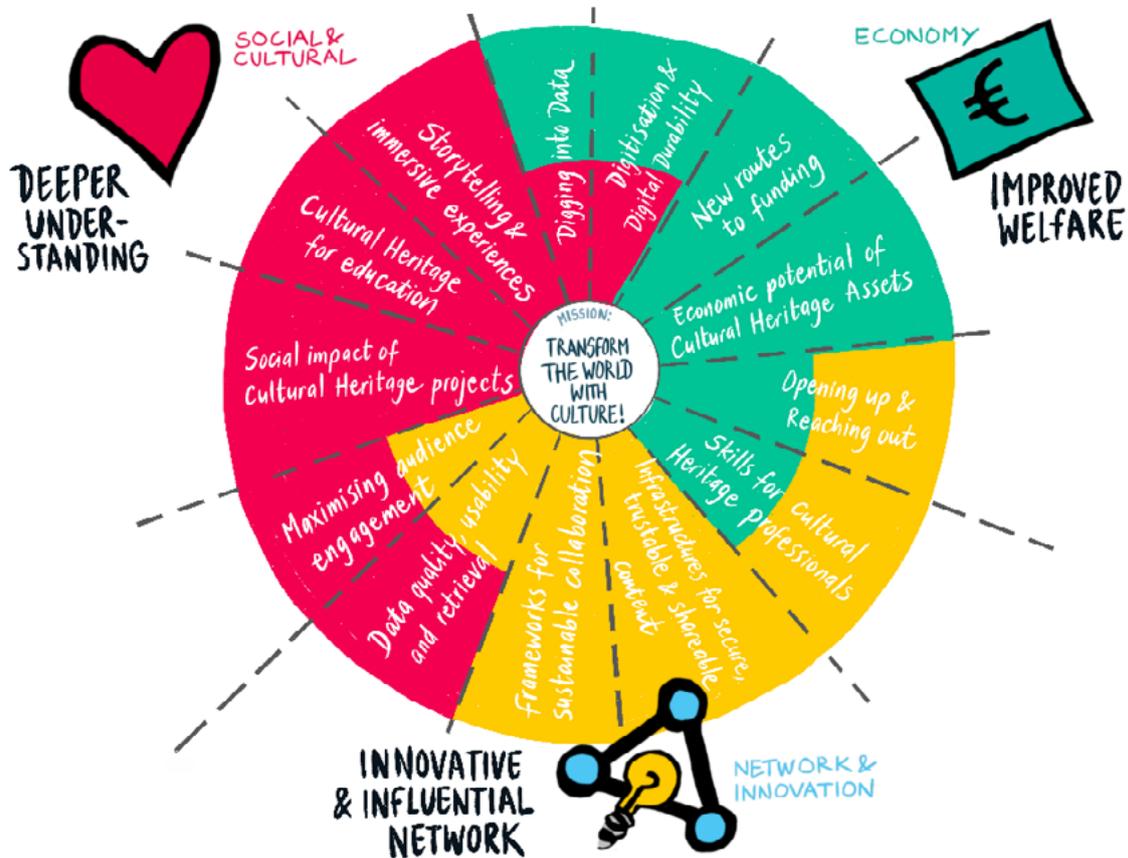
Impact of the innovative cultural heritage sector

Deeper understanding - social and cultural impact

International projects that enable people to explore topical societal issues through engaging narratives will offer a deeper understanding of the contemporary challenges and foster inclusive and reflective societies. Digital platforms will help to overcome socioeconomic, demographic and geographic boundaries and facilitate opportunities for individuals to engage in a dialogue and shape European identities together. With a better understanding of their audiences, heritage organisation will successfully engage more diverse social groups.

The development of immersive technologies will bring audiences closer to the artefacts from the past and offer new perspectives. Open access to massive digitised collections will provide opportunities to embed cultural assets in digital education platforms as well as offer opportunities for exploitation in other industries.

Using technological innovations, the

sector will provide new insights into the shared European past. Digitisation will be a key factor here facilitating opportunities for access and reuse on an unprecedented scale. Novel data analysis and curation methods will unlock a deeper understanding of the European heritage and allow researchers to explore how it continues to shape the present.

Innovative and influential network - impact on network and innovation

Successful realisation of large-scale collaborative projects relies on international and inter-disciplinary synergies between cultural heritage organisation. Frameworks that eradicate legal and technological barriers and demonstrate the mutual benefits of collaboration will encourage individual institutions to open up their resources and engage in international projects.

Infrastructures that address sector-wide issues and provide platforms for improving digital skills and developing interoperable standards will maximise the collaborative potential across the sector. This will empower smaller actors to become more competent and enable them to respond to calls for innovation. Novel technological solutions will introduce disruptive effects within the cultural heritage domain as well as open possibilities to exploit their potential in other sectors. Technologies that can significantly improve data quality, retrieval and interoperability and better respond to end-user needs will have wide application across commercial industries and governmental agencies. Infrastructures that enable the sharing of data in a secure, trustable and efficient way will encourage participation in collaborative projects across Europe as well increase the citizen trust in organisations that handle sensitive information.

Improved welfare - economic impact

Keeping up with the changing socio-economic climate and technological advances requires long-term investments into the development of cultural heritage professionals. Confident and skilled workforce will drive the innovation and research forward and boost competition in the domain. Organisations that are ready to take on innovation challenges will leave a lasting socio-economic impact.

Initiatives that explore new routes for financing will enable cultural heritage institutes to build partnerships with external communities and discover possibilities for exploitation. Digitisation and novel methods for analysing data will play a key role in making cultural assets more financially attractive. With new sources of revenue, the sector will be ready to face financial challenges without sacrificing its research and innovation needs.

Conclusion

The Europeana Foundation will include these recommendations in its advocacy campaigns to invest more in the innovation potential of digital cultural heritage and coordinate the development of an execution plan. As this study shows, there are a number of areas where concerted efforts are needed. There is also a strong sense of urgency to include these innovation needs in the European policies and research and innovation frameworks.

Without adequate support and consolidated efforts, the potential for cultural heritage to serve as a source for inspiration, learning and entertainment will not be fully reached. Opportunities for economic growth in various sectors (notably, tourism and the creative industries) will slow as the sector will not be able to catch up with the ever-changing user demands. And finally, significant investments in digitisation to date will not be recouped by socioeconomic gains.

Coordinated action in this area will open up unique opportunities to the European society. It will change the nature and scale of research in Social Sciences and Humanities. It will provide computer science with training data to improve AI-driven solutions in a range of application fields. It will help us to understand social, cultural and economic patterns over longer periods that will inform our choices for possible future paths. It will fundamentally change the ease by which we access information, which in turn will serve as a catalyst for generating new knowledge, for designing novel learning methods and for uncovering multiple viewpoints on any given topic.

The support for executing the research and innovation priorities proposed in this Agenda will ensure we reap the benefits of the digital transformation in the heritage domain while guarding against potential undesired consequences.

Disclaimer

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